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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,069	03/09/2007	John Gough Errington	27606-00001	1467
30678 7590 07/13/2010 CONNOLLY BOVE LODGE & HUTZ LLP 1875 EYE STREET, N.W. SUITE 1100 WASHINGTON, DC 20006				
EXAMINER				
EWALD, MARIA VERONICA				
ART UNIT		PAPER NUMBER		
1791				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/596,069

**Applicant(s)**

ERRINGTON ET AL.

**Examiner**

MARIA VERONICA D. EWALD

**Art Unit**

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35, 37 and 38 is/are pending in the application.
- 4a) Of the above claim(s) 1-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-35, 37 and 38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 26 – 32, 35 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Tuil (WO 02/20238) in view of Chapman (WO 03/037598). Van Tuil teaches an apparatus for the production of a foamed product with a thickness of up to approximately 1 meter, including a) a cavity (paragraph 0021); (b) a mould capable of containing a raw material that is able to be melt processed when subjected to heat and pressure treatment to form a foam (paragraph 0021); (c) at least one magnetron capable of microwave heating the raw material in a microwave heating cycle (paragraph 0021); (d) at least one inlet through which a compressed gas passes (paragraph 0021); and, (e) at least one outlet for depressurization; characterized in that the apparatus is capable of subjecting the raw material to controlled pressure increases and decreases using compressed gas in conjunction with microwave heating (paragraph 0021).

Van Tuil teaches the fabrication or formation of a foamed product wherein the starting raw material is transferred to a mold. The mold is “preferably enclosed in a larger closed-off space” and connected to the outside environment through an outlet valve, which is closed at the beginning of the process. The mold is then heated to the

process temperature using *continuous heating which can occur via microwave heating* until the foam reaches its desired internal temperature (paragraph 0021). In addition to the continuous heating process, the pressure in the mold can be increased by applying an elevated pressure at the start *or by adding more blowing agent to the mold*. Thus, the mold is subjected to pressurization and depressurization (because after a certain time period, the mold is rapidly depressurized) *in conjunction with microwave heating*. Even if the process is discontinuous *or semi-continuous (paragraph 0025), the melt is still subject to pressurization/depressurization in conjunction with microwave heating*.

Furthermore, Van Tuil teaches that the compressed gas is air; wherein the apparatus further includes a sealed chamber within which the mould and raw material are placed, the chamber is positioned inside the apparatus cavity, and the chamber containing the mould and raw material, is pressurized (paragraph 0022); wherein the outlet is a valve (paragraph 0021); and wherein there is an injection port for the insertion of raw material into the mold (paragraph 0021).

Van Tuil, however, does not teach that the mold is substantially microwave transparent and coated with a susceptor material and further does not teach the parameters of the microwave heating or that there is a plurality of magnetrons.

In an apparatus and process to produce a foamed product, Chapman teaches the use of a mold disposed in a microwave heating chamber or generator (page 5, lines 5 – 10), using a number of magnetrons (page 8, lines 5 – 9). The molds include vent holes allowing air and vapor to escape (page 10, lines 9 – 11). Furthermore, the mold includes a susceptor (or is a susceptor itself), able to absorb and convert microwave

energy into thermal energy (page 10, lines 12 – 17). The susceptor may be in the form of a coating or thin film on the mold surface (page 11, lines 10 – 15). The mold is subject to heating ranging from 5 – 10°C per second of temperature rise and a microwave frequency from 100 MHz to 5 GHz, preferably using a frequency of 2450 MHz (page 12, lines 15 – 23).

Therefore, because Chapman like Van Tuil teaches the use of molding in conjunction with microwave heating, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Van Tuil such that the mold is microwave transparent and coated with a susceptor material wherein the apparatus is operated at the parameters as claimed for the purpose of 1) ensuring that the microwave energy is sufficiently distributed to the material being molded and foamed and 2) because the parameters as claimed are typical operating parameters as taught by Chapman.

Claims 33 – 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Tuil in view of Chapman and further in view of Apte, et al. (U.S. 5,010,220). Van Tuil and Chapman teach the characteristics previously described but do not teach the presence of a pressure window.

Apte, et al. teach an isostatic press, which is subject to microwave energy heat. The use of microwave energy transmits heat directly to the body being worked upon and thus, causes little heating of the apparatus itself (column 2, lines 35 – 38). The apparatus of Apte, et al. includes a frame into which the press is disposed. A magnetron

(item 19a – figure 2) transmits the microwave energy through a wave guide (item 19 – figure 2) and to the press. The cavity of the chamber may be held within a microwave-transparent container of quartz, for example, allowing the energy to fully contact the body being worked upon (column 3, lines 45 – 48). Furthermore, a conventional magnetron generates the microwaves at a frequency of 2.45 GHz or 915 Mhz, generating enough heat to raise the temperature to 2100°C in as little as 5 to 10 minutes (column 3, lines 50 – 55).

As an alternative to the embodiment of figure 2, Apte, et al. also teach that the pressure vessel may be comprised of a chamber sealed by a lid having a microwave transparent window such that microwaves are transmitted through the window (column 5, lines 55 – 60). Using this arrangement allows the inclusion of a pressure shutter behind the window which protects the window during the pressure cycle. Thus, it is not necessary to move the vessel from a heating station to a pressurizing station.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Van Tuil with the parameters and susceptor material of Chapman, further configured with the pressure window of Apte, et al. for the purpose of transmitting the microwave energy through the surfaces and to the body being worked upon, thereby ensuring that the heat is fully transferred through the mold surfaces.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Tuil in view of Chapman and further in view of Smith (U.S. 4,492,839). Van Tuil and

Chapman teach the characteristics previously described but do not teach that there is a valve *and choke system* capable of controlling the pressure during processing. It is noted that Van Tuil teaches a valve to control the introduction of blowing agent or air, but Van Tuil does not teach the additional use of a choke.

In an apparatus to heat food products using microwave energy, Smith teaches a heating section with a microwave generating portion such that choke seals (item 118a, b – figure 3; also front page) are disposed on the sides of the apparatus. The choke seals are comprised of spaced-apart aluminum plate portions and spaced apart rings (column 9, lines 7 – 12) which block waves of microwave radiation from escaping, thereby controlling microwave radiation losses (column 9, lines 3 – 5 and 12 – 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Van Tuil with the susceptor material and operating parameters of Chapman, further configured with the choke elements of Smith for the purpose of preventing microwave radiation from escaping the chamber.

### ***Response to Arguments***

14. Applicant's arguments filed April 28, 2010 have been fully considered but they are not persuasive. Applicant's primary argument is that the primary reference of Van Tuil *fails to teach that the mold inner surface or more specifically, that the material within the mold is heated via microwave heating*. Furthermore, Applicant argues that

Van Tuil only teaches the use of microwave heating of the mold and does not discuss the parameters or elements of microwave heating.

The Examiner disagrees with Applicant's assertion that Van Tuil does not teach that the inner surface of the mold or that the material itself is heated. Because Van Tuil states that the mold is heated using microwave heating *until the internal temperature has attained the required temperature, Van Tuil does indeed teach that the inner surface of the mold is heated.* Van Tuil continues to state, in paragraph 0021, that the processing conditions of the foam mold *depend on the biopolymer being foamed. Such processing conditions may range from 100 – 200°C and from 1 – 50 bar. Thus, the purpose of heating the foam mold is to heat the material inside the mold or else maintaining processing conditions in a specific range would not be important.*

Furthermore, subjecting a mold to a temperature change, whether heating or cooling, is not for the purpose of simply heating (or cooling) a mold exterior surface. *One of ordinary skill in the art of molding, whether press molding, injection molding, vacuum molding or foam molding, is well aware that maintaining a mold temperature is to ensure that the material within the mold or that which is being molded cures or sets at a desired rate, to produce a high quality product.* For example, typical injection molding apparatus include heating and/or cooling elements disposed about or embedded within the mold surface to control the rate of flow into the mold and the molded product's curing rate. Likewise, thermoforming molds may include heating/cooling passages to control the rate at which a blank sets into its final shape.

In addition, the Examiner does not dispute Applicant's assertion that Van Tuil fails to teach the specific parameters of microwave heating. As noted in the rejection, the Examiner specifically points to Chapman, et al. which teach the elements of microwave heating, including the plurality of magnetrons and wherein the mold is comprised of a microwave transparent coating or material. Even if Van Tuil only teaches microwave heating as one viable option for heating the foam mold, the Examiner contends that the combination of Van Tuil and Chapman, et al. is proper because both teach molding foam products, utilizing analogous apparatus. Chapman, et al. is merely cited as teaching the structural components which are not explicitly identified by Van Tuil. The primary reference of Van Tuil *is already teaching microwave heating of the foam mold and thus, remedying the deficiencies of Van Tuil using the reference of Chapman, et al. merely renders obvious 1) the specific parameters under which microwave heating occurs, 2) the use of a plurality of magnetrons and 3) the use of a microwave transparent mold.*

Because the Examiner maintains the rejection of independent claim 26, rejections of the remaining dependent claims are therefore also maintained. The Examiner contends that each combination of reference(s) used is proper and renders the recited claim limitations obvious.

### ***Conclusion***

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA VERONICA D. EWALD whose telephone number is (571)272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVE

/Maria Veronica D Ewald/  
Primary Examiner, Art Unit 1791